What is claimed is:

1. A radiation image storage panel having a stimulable phosphor layer and a light-reflecting layer provided thereon, wherein said stimulable phosphor layer scatters both of a stimulating light and a stimulated emission emitted by said phosphor layer with a scattering length of 5 to 20 μm and said light-reflecting layer scatters a stimulating light with a scattering length of 5 μm or less.

2. The radiation image storage panel of claim 1, wherein said stimulable phosphor layer comprises stimulable phosphor particles and a binder in a weight ratio of 1:10 to 1:50.

3. The radiation image storage panel of claim 2, wherein said stimulable phosphor particles have a mean particle size in the range of 2 to 10 μm.

4. The radiation image storage panel of claim 2, wherein said stimulable phosphor particles are contained in the phosphor layer at a packing density of 60 vol.% or more.

5. The radiation image storage panel of claim 1, wherein said stimulable phosphor has a protective layer on the side opposite to the light-reflecting layer, said protective layer has a haze in the range of 5 to 80%.

6. The radiation image storage panel of claim 5, wherein said protective layer comprises a polymer material and a filler dispersed in the polymer material, said filler having a mean particle size of 0.1 to 10 μm and being contained in the protective layer in an amount of 5 to 50 wt.% based on an amount of the polymer material.

7. The radiation image storage panel of claim 1, wherein a support sheet is attached to the light-reflecting layer via a cured adhesive layer.

8. The radiation image storage panel of claim 7, wherein the cured adhesive layer is cured in the presence of a curing agent.

9. The radiation image storage panel of claim 8, wherein the curing agent is an isocyanate compound.

10. The radiation image storage panel of claim 7, wherein the cured adhesive layer has a thickness of 1 to 50 μm.

11. A process for reading a radiation image information out of a radiation image storage panel of claim 1, which comprises the steps of:

placing means for emitting stimulating light and photoelectrically detecting stimulated emission in the vicinity of the radiation image storage panel on a surface side opposite to the light-reflecting layer;

applying a stimulating light to the stimulable phosphor layer of the radiation image storage panel with such stimulating energy that the stimulable phosphor layer emits a stimulated emission in an amount corresponding to 10 to 90% of a saturation level, while moving said means relatively to a position of the radiation image storage panel along a surface of the radiation image storage panel and scanning the stimulating light in a direction differing from a direction of the movement of the means;

detecting the stimulated emission in sequence by the means; and

converting the detected stimulated emission into electric signals corresponding to a radiation image information.

12. The process of claim 11, wherein the stimulating light is applied to the stimulable phosphor layer of the radiation image storage panel with such stimulating energy that the stimulable phosphor layer emits a stimulated emission in an amount corresponding to 30 to 90% of a saturation level.

13. The process of claim 11, wherein the means for emitting stimulating light and photoelectrically detecting stimulated emission comprises a line sensor composed of plural photoelectric conversion elements aligned in line.